

Name: _____ Date: _____

Polynomial Operations EXAM (version 225)

1. Let polynomials $p(x)$ and $q(x)$ be defined below.

$$p(x) = x^5 - 8x^4 - 10x^3 - 6x^2 - 5$$

$$q(x) = 7x^5 + 2x^3 - x^2 - 8x + 4$$

Express the difference $q(x) - p(x)$ in standard form.

2. Let polynomials $a(x)$ and $b(x)$ be defined below.

$$a(x) = -9x^2 + 5x + 6$$

$$b(x) = -6x - 5$$

Express the product $a(x) \cdot b(x)$ in standard form.

3. Express $(x + 1)^5$ in standard (expanded) form.

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4. Let polynomials $f(x)$ and $g(x)$ be defined below.

$$\begin{aligned}f(x) &= -5x^3 + 27x^2 - 25x - 21 \\g(x) &= x - 4\end{aligned}$$

The quotient of $\frac{f(x)}{g(x)}$ can be expressed as a polynomial, $h(x)$, and a remainder, R (a real number).

$$\frac{f(x)}{g(x)} = h(x) + \frac{R}{x - 4}$$

By using synthetic division or long division, express $h(x)$ in standard form, and find the remainder R .

5. Let polynomial $f(x)$ still be defined as $f(x) = -5x^3 + 27x^2 - 25x - 21$. Evaluate $f(4)$.